DURAN electrónica

DURTOX-X

ELECTROCHEMICAL DETECTOR FOR TOXIC GASES AND OXYGEN

Installation & User Manual

Certificate nº FS82426

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DURTOX

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1. DURTOX-X. Electrochemical technology detectors

DURTOX-X is a flameproof detector using electrochemical technology for the detection of toxic gases and O_2.

Available gases	Standard range	Installation height	Area covered
Carbon monoxide CO	0-300ppm	1,50 to 2m from floor	300 m^2
Hydrogen sulfide H_2S	0-100ppm	1m from floor	150 m^2
Ammonia NH_3	0-100ppm	30cm from ceiling	75 m^2
Nitrogen dioxide NO_2	0-20ppm	1m from floor	200 m^2
Oxygen O_2	0-25% vol	1,70 to 2m from floor	200 m^2

Communication formats

- **RS485C** addressable, 4 wire connection, compatible with **EUROSONDELCO** and **SIEMENS CC62P** control panels. Up to 16 detectors can be connected in parallel on the same loop.

- **4-20mA**, 3 wire connection, compatible with any standard system provided with this type of input.

Applications

DURTOX-X flameproof detectors have been designed for environments in which the formation of explosive atmospheres due to gases, vapours, fogs or suspended dust may occur, assuring a high protection level.
(Group of apparatus II – **ATEX** Directive Category 2)

Special features

- **Provided with a 12bit microprocessor** allowing total control over the sensor status.

- **Thermal compensation** that allows a correct response from each of the electrochemical sensors when faced with temperature variations, except for DURTOX-X O2, which due to its systems does not require such a feature.

- **Self testing hardware.**

- **Digital filter** based on variable samplings of the sensor average values

- **Auto-Zero automatic adjustment** This special feature monitors zero value in relation to sensor response and electronics. The following protocol is used for this: Every 30 minutes an automatic test is performed, if drift is +/- than 2% of the full scale, it will readjust itself to zero, otherwise it will be shown as a readout.

- **Other features** accessible with factory based methodology allow us to check on the sensor remaining useful life, date of manufacture, date of last calibration and serial number.

2. RELAY OUTPUT MODULE (optional)

The optional relay output for the RS485C models of **DURTOX-X** is programmed with the following default values:

Activated, instantaneous –no delay-

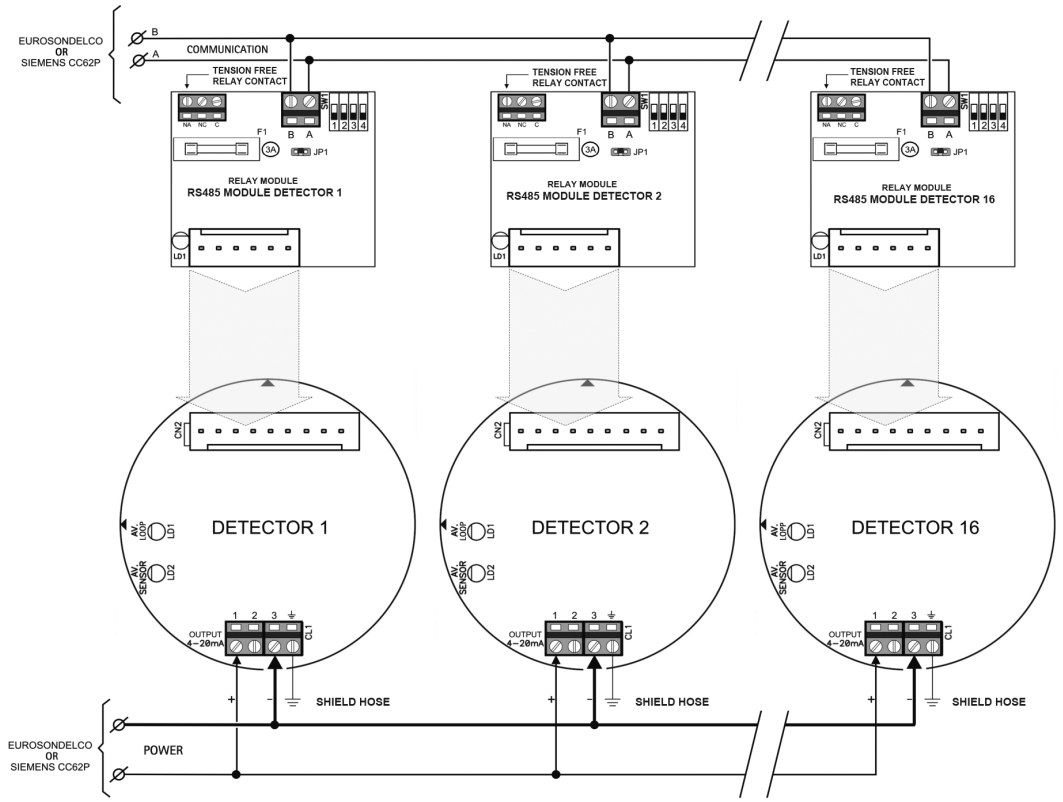
Alarm: 50ppm for CO, 10ppm for H_2S, 25ppm for NH_3, 5ppm for NO_2, <18% for O_2

3. CONNECTIONS

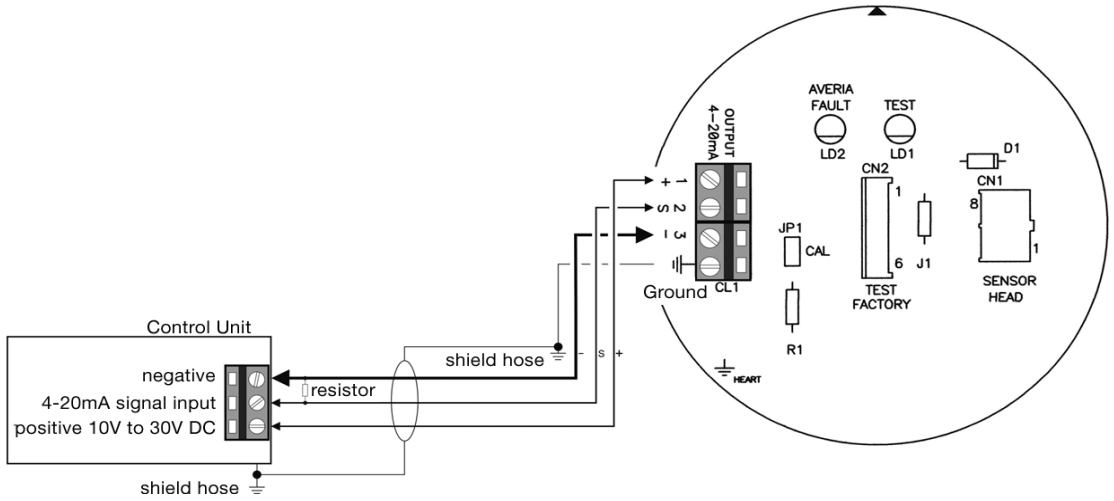
IMPORTANT – Instructions regarding cable glands for ATEX detectors:

The user must ensure the cable is well anchored. The minimum torque setting applicable to the cap is 20 Nm. Check cable entry tightness after any maintenance operation: If cable has moved, tighten up the cap again. If tightening is not possible, send the detector back to factory for cable gland replacement.

DURTOX-X with RS485C communication:



DURTOX-X with 4-20mA communication:



IMPORTANT: If the system where detectors are to be connected does not have 4-20mA inputs, but 0-5V or 0-10V DC tension inputs, a resistance must be connected between negative (-) and signal (S), on the receptor device. Resistance value will depend on the detector power tension in accordance to the following table:

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Detector Tension	Load Resistance	Tension Range (4-20mA)
Between 10V and 18V DC	250 Ω 1%	From 1V to 5V DC
Between 18V and 30V DC	500 Ω 1%	From 2V to 10V DC

4. ADDRESSING RS485C DETECTORS

Before connecting **DURTOX-X** detectors to **EUROSONDELCO** or **SIEMENS CC62P**, they must be addressed. If more than one detector is connected to the same loop, assign a number to each of them according to table 1.

Table 1- NUMBERING DETECTORS USING SW1 (addressing)

Detector nr.	1	2	3	4
01	On	On	On	On
02	Off	On	On	On
03	On	Off	On	On
04	Off	Off	On	On
05	On	On	Off	On
06	Off	On	Off	On
07	On	Off	Off	On
08	Off	Off	Off	On
09	On	On	On	Off
10	Off	On	On	Off
11	On	Off	On	Off
12	Off	Off	On	Off
13	On	On	Off	Off
14	Off	On	Off	Off
15	On	Off	Off	Off
16	Off	Off	Off	Off

5. OPTICAL INDICATORS (internal LEDs): Signals and functioning

RS485C models – installed in vertical module -

- Fast intermittent: during initialization and recognition of the loop by the module line.
- Periodic intermittent: normal functioning. Time between blinking, in seconds, will correspond with the assigned number of the detector (1 to 16).
- 6-blink burst: Line failure. A-B communication cable is cut.
- 1 second cadence: failure or short circuit in the A-B communication lines. More than 5 minutes have passed without the detector being able to communicate with the module line.

4-20mA models –installed in main module-

- LD1: indicates the detector operational status.
- LD2: this LED will turn on in case of any internal failure in the detector as well as to indicate a positive or negative scale overflow.

6. TEST

Once connected, **DURTOX-X** begins to count a 60 second sensor stabilization time. During this time the 4-20mA model will have a tension output of only 1,9mA, later increasing to 4mA.

Do not open these detectors while powered. Adjustments or calibrations on the installation are not allowed. Due to the technology applied, these operations can only be carried out at the factory.

Perform a check-up test at least once a year using gas tester containers with the right composition for each gas. Using any other means could poison or destroy the sensor and, therefore, the warranty would be invalidated.

All detectors manufactured by **DURAN ELECTRONICA** are factory calibrated with the appropriate target gas. Therefore do not need to be recalibrated during initial startup of the installation.

7. TECHNICAL CHARACTERISTICS

Technology	12bit Microprocessor and electrochemical sensors
Power	10 to 30V DC (4-20mA)/10 to 15V (RS485C)
Maximum consumption	43mA to 12V DC
Useful life	± 2 years in air, >3 years CO
Accuracy	± 3% bottom of scale
Repeatability	± 3% bottom of scale
Initialization stabilization delay when connecting - all versions -	Approx. 5 minutes
T90 response time	CO & NH3 ≤30s H2S ≤ 20s O2 ≤ 15s
Temperature and humidity ranges	-10ºC to +50ºC 20-90% Hr
Working atmospheric pressure	90-110 KPa
Air velocity	<0.1-0.5m/s
Maintenance periods	Annual - recommended -
Regulation code for explosive atmospheres (gas/dust)	Ex d IIC T6 Gb / Ex tb IIIC T85ºC Db
Housing material	Aluminium & Epoxy paint
Stopping plug material	Type PLG
Cable gland material and cable diameter	Natural brass & Santoprene 6-10mm^2
Adaptor material & syntherized filter	Stainless steel.
Cable type (RS485)	4 wire shielded (power 2 x 1,5 + A and B communications 2 x 0,25 twisted pair)
Cable type (4-20mA)	3 X 1,5mm Ø shielded, recommended minimum
Maximum installation distance	1000m (RS485C) & 350/400m (4-20mA)
Dimensions (mm) & weight (gr)	155 x 180 x 110 / 1.700 Approx.

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8. INFORMATION ABOUT ATEX MARKING

CE 0163	CE marking in conformity with Directive 94 / 9 / EC (ATEX). (the number 0163 corresponds to the Notified Body, in this case the J.M.Madariaga Official Laboratory – LOM).
II 2 G Ex d IIC T6 Gb	Materials with “d” enclosure protection (flameproof) for use in explosive gas atmospheres and with a “high” level of protection (Gb).
II 2GD Ex d IIC T6 Gb Ex tb IIIC T85 ºC Db	Materials with “d” enclosure protection (flameproof) for use in explosive gas atmospheres and with a “high” level of protection (Gb). Materials with “t” enclosure protection for use in explosive dust atmospheres and with a “high” level of protection (Db).
LOM 10ATEX2076	EC Type Examination Certificate

9. WARRANTY

DURTOX-X detectors are guaranteed against any manufacturing defect for a 1 year period after the acquisition of the equipment. If, during this period of time, any anomaly was detected, please inform your provider or installer.

Warranty covers the full repair of the equipment which **DURAN ELECTRONICA** Technical Department considers to be defective, with the purpose of bringing them back to their normal use. This warranty will be valid as long as the equipment has been installed by a competent person, and always following the specifications contained in this manual. Negligent installation or use will exempt **DURAN ELECTRONICA** from any responsibility from damages caused to objects and/or people, and from the fulfillment of the terms of this warranty. In case of improper handling, or not respecting the conditions, characteristics and observations described in this manual, **DURAN ELECTRONICA** will not hold itself responsible for damages caused by improper use of this product.

Warranty does not include: installations, periodic tests and maintenance, damages caused by inadequate handling, inappropriate use, negligence, overload, inadequate power or equipment abandonment, tension deviations, defective installations and all other external causes, repairs or amendments made by personnel not authorized by **DURAN ELECTRONICA** and transportation costs of the equipments.

DURAN ELECTRONICA reserves the right to carry out improvements or to include modifications the equipment without prior notice.

10. DECLARATION CE OF CONFORMITY

Víctor Manuel Andrés González, Managing Director of:

DURAN ELECTRÓNICA, S. L.
Tomás Bretón, 50 - 28045 MADRID (Spain)

Declares the conformity of gas detector model **DURTOX-X** with the dispositions contained in the following European Parliament and Council directives:

2004/108/EC Electromagnetic compatibility

94/9/EC Equipment and protective systems intended for use in potentially explosive atmospheres

conformity assumed in relation to the following standards:

EN 60079-0:2009 **EN 60079-1:2007** **EN 60079-31:2009**

Year of affixing of regulatory marking: Ex d IIC T6 Gb: 2010
Ex tb IIIC T85 ºC Db: 2012

EC Type examination certificate number **LOM 10ATEX2076**

Product Quality Guarantee Notification number: **LOM 08ATEX9073**
Issued by notified body number 0163: Laboratorio Oficial J. M. Madariaga (LOM)
C/ Eric Kandel, nº 1 28906 Getafe - MADRID (Spain), that authorizes the legal marking to be affixed on the product.

CE 0163 Ex II 2 G

Ex II 2GD

The LOM 10ATEX2076 certificate does not cover that indicated in the paragraph 2, Article I of the 94/9/EC directive related to safety, controlling and regulating devices, nor the Essential Health and Safety Requeriments indicated in the paragraphs 1.5.5, 1.5.6 and 1.5.7 of the Annex II of the Directive 94/9/EC related to devices with a measuring function.

In witness whereof and for such purposes as may arise

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